SEQUENCE LISTING

<110> FRANZOSO, GUIDO
DESMAELE, ENRICO
ZAZZERONI, FRANCESCA
PAPA, SALVATORE

<120> METHODS AND COMPOSITIONS FOR MODULATING APOPTOSIS

<130> 21459-94575

<140> 10/626,905
<141> 2003-07-25

<150> PCT/US02/31548
<151> 2002-10-02

<150> 10/263,330
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<160> 53

<170> PatentIn Ver. 3.2

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<210> 2
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<212> PRT
<213> Homo sapiens

<400> 2

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             20                  25                  30

Gln Asp Arg Leu Thr Val Gly Val Tyr Glu Ser Ala Lys Leu Met Asn
         35                  40                  45

Val Asp Pro Asp Ser Val Val Leu Cys Leu Leu Ala Ile Asp Glu Glu
     50                  55                  60

Glu Glu Asp Asp Ile Ala Leu Gln Ile His Phe Thr Leu Ile Gln Ser
 65                  70                  75                  80

Phe Cys Cys Asp Asn Asp Ile Asn Ile Val Arg Val Ser Gly Asn Ala
                 85                  90                  95

Arg Leu Ala Gln Leu Leu Gly Glu Pro Ala Glu Thr Gln Gly Thr Thr
            100                 105                 110

Glu Ala Arg Asp Leu His Cys Leu Pro Phe Leu Gln Asn Pro His Thr
        115                 120                 125

Asp Ala Trp Lys Ser His Gly Leu Val Glu Val Ala Ser Tyr Cys Glu
    130                 135                 140

Glu Ser Arg Gly Asn Asn Gln Trp Val Pro Tyr Ile Ser Leu Gln Glu
145                 150                 155                 160

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<210> 3
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<213> Mus musculus

<400> 3

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<213> Mus musculus

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Gln Ala Val Thr Ala Ala Val Glu Gln Leu Leu Val Ala Ala Gln Arg
20 25 30

Gln Asp Arg Leu Thr Val Gly Val Tyr Glu Ala Ala Lys Leu Met Asn
35 40 45

Val Asp Pro Asp Ser Val Val Leu Cys Leu Leu Ala Ile Asp Glu Glu
50 55 60

Glu Glu Asp Asp Ile Ala Leu Gln Ile His Phe Thr Leu Ile Gln Ser
65 70 75 80

Phe Cys Cys Asp Asn Asp Ile Asp Ile Val Arg Val Ser Gly Met Gln
85 90 95

Arg Leu Ala Gln Leu Leu Gly Glu Pro Ala Glu Thr Leu Gly Thr Thr
100 105 110

Glu Ala Arg Asp Leu His Cys Leu Leu Val Thr Asn Cys His Thr Asp
115 120 125

Ser Trp Lys Ser Gln Gly Leu Val Glu Val Ala Ser Tyr Cys Glu Glu
130 135 140

Ser Arg Gly Asn Asn Gln Trp Val Pro Tyr Ile Ser Leu Glu Glu Arg
145 150 155 160

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<211> 1355
<212> DNA
<213> Homo sapiens

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cggctggcac aggaggagga gcccgggcgg gcgaggggcg gccggagagc gccagggcct 180
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<210> 6
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<212> PRT
<213> Mus musculus

<400> 6

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             20                  25                  30

Gln Arg Thr Ile Thr Val Gly Val Tyr Glu Ala Ala Lys Leu Leu Asn
         35                  40                  45

Val Asp Pro Asp Asn Val Val Leu Cys Leu Leu Ala Ala Asp Glu Asp
     50                  55                  60

Asp Asp Arg Asp Val Ala Leu Gln Ile His Phe Thr Leu Ile Gln Ala
 65                  70                  75                  80

Phe Cys Cys Glu Asn Asp Ile Asn Ile Leu Arg Val Ser Asn Pro Gly
                 85                  90                  95

Arg Leu Ala Glu Leu Leu Leu Leu Glu Thr Asp Ala Gly Pro Ala Ala
            100                 105                 110

Ser Glu Gly Ala Glu Gln Pro Pro Asp Leu His Cys Val Leu Val Thr
        115                 120                 125

Asn Pro His Ser Ser Gln Trp Lys Asp Pro Ala Leu Ser Gln Leu Ile
    130                 135                 140

Cys Phe Cys Arg Glu Ser Arg Tyr Met Asp Gln Trp Val Pro Val Ile
145                 150                 155                 160
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Asn Leu Pro Glu Arg
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gctcaacgta gaccccgata acgtggtact gtgcctgctg gctgctgacg aagacgacga 360
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<212> PRT
<213> Mus musculus

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Asp Thr Val Gly Asp Ala Leu Glu Glu Val Leu Ser Lys Ala Arg Ser
20 25 30

Gln Arg Thr Ile Thr Val Gly Val Tyr Glu Ala Ala Lys Leu Leu Asn
35 40 45

Val Asp Pro Asp Asn Val Val Leu Cys Leu Leu Ala Ala Asp Glu Asp
50 55 60

Asp Asp Arg Asp Val Ala Leu Gln Ile His Phe Thr Leu Ile Arg Ala
65 70 75 80

Phe Cys Cys Glu Asn Asp Ile Asn Ile Leu Arg Val Ser Asn Pro Gly
85 90 95

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Arg Leu Ala Glu Leu Leu Leu Leu Glu Asn Asp Ala Gly Pro Ala Glu
            100                 105                 110

Ser Gly Gly Ala Ala Gln Thr Pro Asp Leu His Cys Val Leu Val Thr
        115                 120                 125

Asn Pro His Ser Ser Gln Trp Lys Asp Pro Ala Leu Ser Gln Leu Ile
    130                 135                 140

Cys Phe Cys Arg Glu Ser Arg Tyr Met Asp Gln Trp Val Pro Val Ile
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Asn Leu Pro Glu Arg
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<210> 10
<211> 159
<212> PRT
<213> Homo sapiens

<400> 10
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             20                  25                  30

Ala Gln Arg Gln Gly Cys Leu Thr Ala Gly Val Tyr Glu Ser Ala Lys
         35                  40                  45
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Val Leu Asn Val Asp Pro Asp Asn Val Thr Phe Cys Val Leu Ala Ala
     50                  55                  60

Gly Glu Glu Asp Glu Gly Asp Ile Ala Leu Gln Ile His Phe Thr Leu
 65                  70                  75                  80

Ile Gln Ala Phe Cys Cys Glu Asn Asp Ile Asp Ile Val Arg Val Gly
                 85                  90                  95

Asp Val Gln Arg Leu Ala Ala Ile Val Gly Ala Gly Glu Glu Ala Gly
            100                 105                 110

Ala Pro Gly Asp Leu His Cys Ile Leu Ile Ser Asn Pro Asn Glu Asp
        115                 120                 125

Ala Trp Lys Asp Pro Ala Leu Glu Lys Leu Ser Leu Phe Cys Glu Glu
    130                 135                 140

Ser Arg Ser Val Asn Asp Trp Val Pro Ser Ile Thr Leu Pro Glu
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<212> DNA
<213> Mus musculus

<400> 11

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<210> 12
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<213> Mus musculus

<400> 12

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20 25 30

Ala His Gly Gln Gly Cys Leu Thr Ala Gly Val Tyr Glu Ser Ala Lys
35 40 45

Val Leu Asn Val Asp Pro Asp Asn Val Thr Phe Cys Val Leu Ala Ala
50 55 60

Asp Glu Glu Asp Glu Gly Asp Ile Ala Leu Gln Ile His Phe Thr Leu
65 70 75 80

Ile Gln Ala Phe Cys Cys Glu Asn Asp Ile Asp Ile Val Arg Val Gly
85 90 95

Asp Val Gln Arg Leu Ala Ala Ile Val Gly Ala Asp Glu Glu Gly Gly
100 105 110

Ala Pro Gly Asp Leu His Cys Ile Leu Ile Ser Asn Pro Asn Glu Asp
115 120 125

Thr Trp Lys Asp Pro Ala Leu Glu Lys Leu Ser Leu Phe Cys Glu Glu
130 135 140

Ser Arg Ser Phe Asn Asp Trp Val Pro Ser Ile Thr Leu Pro Glu
145 150 155

<210> 13
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 14
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 14
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<210> 15
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 15
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<210> 16
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 17
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
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<400> 17
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<210> 18
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 19
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<220>
<223> Description of Artificial Sequence: Primer

<400> 19
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<210> 20
<211> 36
<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

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<210> 21
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<212> DNA
<213> Artificial Sequence

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<210> 22
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<210> 23
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<212> DNA
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<210> 24
<211> 38
<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

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<210> 25
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 25
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<210> 26
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 26
tagggactct cc 12

<210> 27
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 27
aatattctct cc 12

<210> 28
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<220>
<223> Description of Artificial Sequence: Primer

<400> 28
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<210> 29
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 29
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<210> 30
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<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

<400> 30
ggaaaccccg 10

<210> 31
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<220>
<223> Description of Artificial Sequence: Primer

<400> 31
ggaaatattg 10

<210> 32
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<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

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<210> 33
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<210> 34
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<223> Description of Artificial Sequence: Primer

<400> 34
gatctgaatt ctacttactc tcaagac 27

<210> 35
<211> 2695
<212> DNA
<213> Mus musculus

<400> 35
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ggttgtgagc tgccatattg aaccctgttc ctctggaaga gcagctagtg ctcttaatct 180
ctgagccatt tctctgcccc tgctgtttgt tttgctttgt cttgttttgg tttcgtttcg 240
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tagcccaggc tggcctcgaa ctcagaaatt cgcctgcctc tgcctcccaa gtgctgggat 360
tgaaggcgtg tgccaccact gcctggcaac aaccagtgtt ctttaaggct gagacatctc 420
tctagcccca cccccaggtt taaaacaggg tctcatttag cccaggctag tctcaaactc 480
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gcctcacaca tgctcagtac gtgctctgcc attgaaccat tgctacagtc cagcagccaa 660
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cactttggag taggtacgga gatcagaaga caattcgcag gagtcagctc gaaccctcca 780
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<210> 36
<211> 10
<212> DNA
<213> Mus musculus

<400> 36
gggactctcc 10

<210> 37
<211> 16
<212> DNA
<213> Mus musculus

<400> 37
ctagggactc tccggg 16

<210> 38
<211> 10
<212> DNA
<213> Mus musculus

<400> 38
ggggattcca 10

<210> 39
<211> 16
<212> DNA
<213> Mus musculus

<400> 39
cgaggggatt ccagac 16

<210> 40
<211> 10
<212> DNA
<213> Mus musculus

<400> 40
ggaaaccccg 10

<210> 41
<211> 16
<212> DNA
<213> Mus musculus

<400> 41
gctggaaacc ccgcgc 16

<210> 42
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 42
Val Asp Val Ala Asp
1

<210> 43
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 43
Asp Glu Val Asp
1

<210> 44
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 44
Val Glu Ile Asp
1

<210> 45
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 45
Ile Glu Thr Asp
1

<210> 46
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 46
Leu Glu His Asp
1

<210> 47
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 47
cgccaccatg gagatggtga acaccat 27

<210> 48
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic oligonucleotide

<400> 48
gtacaagggt atggctatgt caatgggagg tag 33

<210> 49
<211> 1392
<212> DNA
<213> Homo sapiens

<400> 49
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aagctgaagc aggagaaccg ggaggcccgg cggaggatcg acctcaacct ggatatcagc 180
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gaaatcaacg acctggagaa cttgggcgag atgggcagcg gcacctgcgg accggtgtgg 480
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ggcattggcc cc 1392

<210> 50
<211> 401
<212> PRT
<213> Homo sapiens

<400> 50
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Leu Lys Gln Glu Asn Arg Glu Ala Arg Arg Arg Ile Asp Leu Asn Leu
20 25 30

Asp Ile Ser Pro Gln Arg Pro Arg Pro Thr Leu Gln Leu Pro Leu Ala
35 40 45

Asn Asp Gly Gly Ser Arg Ser Pro Ser Ser Glu Ser Ser Pro Gln His
50 55 60

Pro Thr Pro Pro Ala Arg Pro Arg His Met Leu Gly Leu Pro Ser Thr
65 70 75 80

Leu Phe Thr Pro Arg Ser Met Glu Ser Ile Glu Ile Asp His Lys Leu
85 90 95

Gln Glu Ile Met Lys Gln Thr Gly Tyr Leu Thr Ile Gly Gly Gln Arg
100 105 110

Tyr Gln Ala Glu Ile Asn Asp Leu Glu Asn Leu Gly Glu Met Gly Ser
115 120 125

Gly Thr Cys Gly Pro Val Trp Lys Met Arg Phe Arg Lys Thr Gly His
130 135 140

Val Ile Ala Val Lys Gln Met Arg Arg Ser Gly Asn Lys Glu Glu Asn
145 150 155 160

Lys Arg Ile Leu Met Asp Leu Asp Val Val Leu Lys Ser His Asp Cys
165 170 175

Pro Tyr Ile Val Gln Cys Phe Gly Thr Phe Ile Thr Asn Thr Asp Val
180 185 190

Phe Ile Ala Met Glu Leu Met Gly Thr Cys Ala Glu Lys Leu Lys Lys
195 200 205

Arg Met Gln Gly Pro Ile Pro Glu Arg Ile Leu Gly Lys Met Thr Val
210 215 220

```
Ala Ile Val Lys Ala Leu Tyr Tyr Leu Lys Glu Lys His Gly Val Ile
225                 230                 235                 240

His Arg Asp Val Lys Pro Ser Asn Ile Leu Leu Asp Glu Arg Gly Gln
                245                 250                 255

Ile Lys Leu Cys Asp Phe Gly Ile Ser Gly Arg Leu Val Asp Ser Lys
            260                 265                 270

Ala Lys Thr Arg Ser Ala Gly Cys Ala Ala Tyr Met Ala Pro Glu Arg
        275                 280                 285

Ile Asp Pro Pro Asp Pro Thr Lys Pro Asp Tyr Asp Ile Arg Ala Asp
    290                 295                 300

Val Trp Ser Leu Gly Ile Ser Leu Val Glu Leu Ala Thr Gly Gln Phe
305                 310                 315                 320

Pro Tyr Lys Asn Cys Lys Thr Asp Phe Glu Val Leu Thr Lys Val Leu
                325                 330                 335

Gln Glu Glu Pro Pro Leu Leu Pro Gly His Met Gly Phe Ser Gly Asp
            340                 345                 350

Phe Gln Ser Phe Val Lys Asp Cys Leu Thr Lys Asp His Arg Lys Arg
        355                 360                 365

Pro Lys Tyr Asn Lys Leu Leu Glu His Ser Phe Ile Lys Arg Tyr Glu
    370                 375                 380

Thr Leu Glu Val Asp Val Ala Ser Trp Phe Lys Asp Val Met Ala Lys
385                 390                 395                 400

Thr
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<210> 51
<211> 2313
<212> DNA
<213> Mus musculus

<400> 51

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tcatgaagca gacagggtac ctgactatcg ggggccagcg ttatcaggca gaaatcaatg 360
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agaataagcg cattttgatg gacctggatg tagtactcaa gagccatgac tgcccttaca 540
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tgggcatatg tgcagagaag ctgaagaaac gaatgcaggg ccccattcca gagcgaatcc 660
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tcatccatcg cgatgtcaaa ccctccaaca tcctgctaga tgagcggggc cagatcaagc 780
tctgtgactt tggcatcagt ggccgccttg ttgactccaa agccaaaaca cggagtgctg 840
gctgtgctgc ctatatggct cccgagcgca tcgaccctcc agatcccacc aagcctgact 900
atgacatccg agctgatgtg tggagcctgg gcatctcact ggtggagctg gcaacaggac 960
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actgccttac taaagatcac aggaagagac caaagtataa taagctactt gaacacagct 1140
tcatcaagca ctatgagata ctcgaggtgg atgtcgcgtc ctggtttaag gatgtcatgg 1200
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atcgttcact gcacttacta tgcactgaca taatatgcac cacattttgt gattgcaaga 1980
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tttcagtgca aattagagac agttcatgtt ttcttgcagt tgtttttttc tgggggggata 2280
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<210> 52
<211> 346
<212> PRT
<213> Mus musculus

<400> 52

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Met Leu Gly Leu Pro Ser Thr Leu Phe Thr Pro Arg Ser Met Glu Ser
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Ile Glu Ile Asp Gln Lys Leu Gln Glu Ile Met Lys Gln Thr Gly Tyr
             20                  25                  30

Leu Thr Ile Gly Gly Gln Arg Tyr Gln Ala Glu Ile Asn Asp Leu Glu
         35                  40                  45

Asn Leu Gly Glu Met Gly Ser Gly Thr Cys Gly Gln Val Trp Lys Met
     50                  55                  60

Arg Phe Arg Lys Thr Gly His Ile Ile Ala Val Lys Gln Met Arg Arg
 65                  70                  75                  80

Ser Gly Asn Lys Glu Glu Asn Lys Arg Ile Leu Met Asp Leu Asp Val
                 85                  90                  95

Val Leu Lys Ser His Asp Cys Pro Tyr Ile Val Gln Cys Phe Gly Thr
            100                 105                 110

Phe Ile Thr Asn Thr Asp Val Phe Ile Ala Met Glu Leu Met Gly Ile
        115                 120                 125

Cys Ala Glu Lys Leu Lys Lys Arg Met Gln Gly Pro Ile Pro Glu Arg
    130                 135                 140
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Ile Leu Gly Lys Met Thr Val Ala Ile Val Lys Ala Leu Tyr Tyr Leu
145                 150                 155                 160

Lys Glu Lys His Gly Val Ile His Arg Asp Val Lys Pro Ser Asn Ile
                165                 170                 175

Leu Leu Asp Glu Arg Gly Gln Ile Lys Leu Cys Asp Phe Gly Ile Ser
            180                 185                 190

Gly Arg Leu Val Asp Ser Lys Ala Lys Thr Arg Ser Ala Gly Cys Ala
        195                 200                 205

Ala Tyr Met Ala Pro Glu Arg Ile Asp Pro Pro Asp Pro Thr Lys Pro
    210                 215                 220

Asp Tyr Asp Ile Arg Ala Asp Val Trp Ser Leu Gly Ile Ser Leu Val
225                 230                 235                 240

Glu Leu Ala Thr Gly Gln Phe Pro Tyr Lys Asn Cys Lys Thr Asp Phe
                245                 250                 255

Glu Val Leu Thr Lys Val Leu Gln Glu Glu Pro Pro Leu Leu Pro Gly
            260                 265                 270

His Met Gly Phe Ser Gly Asp Phe Gln Ser Phe Val Lys Asp Cys Leu
        275                 280                 285

Thr Lys Asp His Arg Lys Arg Pro Lys Tyr Asn Lys Leu Leu Glu His
    290                 295                 300

Ser Phe Ile Lys His Tyr Glu Ile Leu Glu Val Asp Val Ala Ser Trp
305                 310                 315                 320

Phe Lys Asp Val Met Ala Lys Thr Asp Ser Pro Arg Thr Ser Gly Val
                325                 330                 335

Leu Ser Gln His His Leu Pro Phe Phe Arg
            340                 345
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<210> 53
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
6X-His tag

<400> 53
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His His His His His His
  1               5
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